

## REMARKS

Claims 18-28, and 41-59 are in the application.

Claims 22-28 are withdrawn from consideration as being directed to non-elected inventions, and will be rejoined with the application if claim 21 is deemed allowable.

Claims 1-17 and 29-40 are cancelled without prejudice or disclaimer as being directed to a non-elected invention.

Claims 18-21 and 41-45 are subject to examination.

## ADVISORY ACTIONS

The Examiner, in the outstanding Office Action, invited applicants to “disclose the method steps of generating a hash function in specific terms [as elements of the claims] ... if it is presented in a manner that do[es] not require further search and consideration.” Applicant’s successive attempts to achieve this result met with indications of “new issues”. Apparently, this is not reasonably possible, and the Examiner has provided no guidance as to how this might be achieved. No amendments are presented herein.

## ART REJECTIONS

Claims 18-21 and 43-59 are rejected under 35 U.S.C. § 103(a) as being obvious over Li (US 5,549,953) in view of Waters (US 5,572,589).

The Examiner states that Equation (1) of Li (Col. 6) produces a cipher. This is not the case. A cipher, or more properly cipher, requires a “secret” (Wordnet definition: “a message written in a secret code”, other relevant definitions are consistent therewith). In accordance with Li, the information relating to Equation 1 is public and overt, and therefore NOT cryptographic (latin, meaning “hidden writing”). There is simply no basis to interpret the application of this formula as a “cipher”, a word which is neither present in Li, nor the present claims. The formula, in fact, relates to the apparent color (peak reflectance) of the region.

Li states, in relevant part (Col. 9, line 29-Col. 10, line 47):

4. Operation of optical recording media with optically-variable security properties

FIG. 25 shows an optical recording system employing an optical recording medium with optically-variable security properties in accordance with the invention. The medium is in

the form of a disk, card or a tape, or may be attached to an article to be protected. The authentication of the medium is first verified by a **visual examining the color** of the medium at different viewing angles or by a special device designed for this purpose which is not shown here. A further examination is carried out by checking the information encoded on the optical recording medium. This will be explained in detail in the next few paragraphs. The optical recording system comprises a light source 20 providing light for reading and writing information; a collector lens 21 for collimating the light; a polarizing beam splitter 22 for polarizing and splitting the light; a prism mirror 23 for turning the light; a quarterwave plate 24 for producing a 90.degree. rotation of polarization; an optical recording medium 26 having decodable data and optically-variably security properties in accordance with the invention; a magnetic head 27 for providing a bias magnet and writing information (for magneto-optic media only); an analyzer 28 for producing polarized light (for magneto-optic media only); a toric lens 29; and a detector 30 for detecting and decoding information. The quarterwave plate 24 in conjunction with the polarizing beam splitter 22 provides an optical isolator for the light source 20.

The recording medium 26 shown within marked area in dotted line in FIG. 25 is enlarged (not in dotted line) in FIG. 26(a) and (b), and (c) for different types of recording media. FIG. 26(a) shows a read-only or write-once optical recording medium 26 having optically-variable security properties. For a read-only medium, information such as bar codes and digital data is pre-coded by photographic means and is unchangeable. For a write-once medium, the information is stored by marking the recording layer with the focused laser 20 operating at a higher power level. The formation of the recorded marks is an irreversible thermal response to the laser energy absorbed by the recording layer, which includes local melting, vaporization or ablation, deformation and compositional changes in the recording layer. Therefore, after the information is written, it is not changeable. The information is retrieved by using a lower laser power. The reflectances  $R_{\text{sub.0}}$  (31) and  $R_{\text{sub.1}}$  (32), corresponding to the areas where the recording layer 14 is unmarked("0") and marked ("1"), are detected by the detector 30 and then checked by an electric system which is similar to systems known in prior arts and hence is not shown here.

This clearly indicates that the security feature disclosed by Li is an overt feature whose security derives from a technological impediment, not a cryptographic one. The writing of the optically variable layer is quite deterministic, and there is simply no disclosure that any non-deterministic aspect of the manufacturing or writing process is relevant to the result.

Waters also provides a quite intentionally and deterministically produced defect pattern.

Independent claim 11 requires a "randomly determined" pattern of optically readable characteristics, from a "nondeterministic manufacturing physical process" and a "recorded hash of identifications". Neither Li nor Waters shows either of these features, and the claim is therefore distinguished.

Independent claim 21 requires “an ascertainable pattern formed during a physical non-deterministic manufacturing process formed on the disk” and a “printed code ... based on the ascertainable pattern” which provides “self authentication for the disk”. Neither Li nor Waters shows either of these features, and the claim is therefore distinguished.

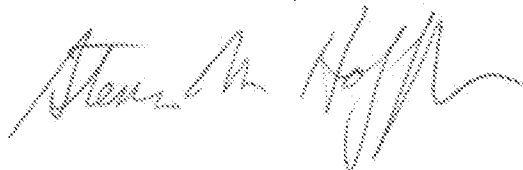
Independent Claim 43 provides “regions of said substrate having optically readable characteristics which are randomly determined by a non-deterministic physical manufacturing process” and “disposed sets of recorded hashes, each respective hash being formed from a respective data pattern and characteristics of a respective region”. Neither Li nor Waters shows either of these features, and the claim is therefore distinguished.

Independent claim 46 provides “a set of optically readable characteristics which are randomly determined by a non-deterministic physical manufacturing process” and “a cryptographically processed set of identifications of the random optically readable characteristics and the data pattern associated with the data storage medium”. Neither Li nor Waters shows either of these features, and the claim is therefore distinguished.

The references alone, or in combination, do not teach or suggest the presently claimed invention, and therefore the Examiner fails to set forth a prima facie case of obviousness.

It is therefore respectfully submitted that the present claims are patentable, and a Notice of Allowance is respectfully solicited.

Respectfully submitted,  
MILDE & HOFFBERG, LLP

A handwritten signature in black ink, appearing to read 'Steven M. Hoffberg', written over a horizontal line.

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